INSTALLATION

Place or mount the RBI-1 in close proximity to the Kenwood mobile radio to be used. Connect the RBI-1 with the provided PG-4H Cable from the 8 pin modular jack marked "RADIO" to the Kenwood Microphone jack. Only Port 1 (140/DUAL) will support a Dual Band radio. Port 1 is the only Port the 140 Mhz radio can be connected to.

The RBI will support all 4 bands (140/220/440/1200) as follows:
If Port one is filled, Port 2 is for 220 only, Port 3 is for 440 only, Port 4 is for 1200 only. Basically, if the selected band is unavailable on Port 1 it will go to the port hard assigned to that band.

RBI-1 Connector J2 **Pin# - Line Name**	**RLC-4 Connections** **Pin# - Line Name**
1 - RBI-1 RESET	Output #2, P5 pin 12 on the I/O Connector
2 - "S" Meter output	(optional) connect to analog input
3 - Data	Output #3, P5 pin 11 on the I/O Connector
4 - Clock/Strobe	Output #4, P5 pin 10 on the I/O Connector
	Connections to the radio port (DB-9)
5 - Kenwood TX Audio (T Pot)	4 - RLC-4 audio out
6 - Kenwood RX Audio (R Pot)	5 - RLC-4 audio in
7 - COS from Kenwood RX	7 - RLC-4 COR input (Set the COR to active low with C013)
8 - PTT to Kenwood TX	3 - RLC-4 PTT output
9 - Ground	1 - RLC-4 ground connection
2 - RLC-ICM (not RBI-1) PL Detect Out	2 - RLC-4 PL detect input (optional)

In case it wasn't clear, there is only one connector on the RBI-1 that goes to the RLC-4. It is connected to two different connectors on the RLC-4. The DB-9 connector provides the audio, COR and PTT connections. The DB-25 connector provides the control signals.

Audio receive level from the Kenwood to the Controller is controlled by VR2 (R). The audio level from the Controller to the Kenwood is adjusted by VR1 (T). Refer to your manuals for additional adjustments in your controller.

Capacitor C5 (10uF) Inside the RBI-1 Interface must be removed and replaced with a 1uF/25V Tantalum Capacitor for the Audio to sound correct.

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466-3777

Step #3: Connecting Your Receivers to the RLC-4

The radios connect to the RLC-4 using a male DB-9 connector (included). The pin-outs are listed below.

Pin Number	Description
1	Ground
2	PL Input (From your PL Decoder)
3	PTT Output (To the Transmitter)
4	Audio Output (To the Transmitter) 600 Ω
5	Audio Input (From the Receiver) 10K Ω
6	Ground
7	COR (From your Receiver)
8	Ground
9	Ground

Connecting the Receiver COR

The first step in connecting your receiver is to locate an active receiver signal. If the voltage goes from a voltage above 3 volts to ground when a signal is present, the signal is active low. If the voltage goes from ground to a voltage above 3 volts the signal is active high. The RLC-4 accepts active low COR signals by default, but this can be changed for one or more of the radio ports with command 013. The signal must be able to sink 4mA to ground. The input impedance of the RLC-4 COR input is 10KΩ and it is diode clamped with internal pull-up resistors. This allows it to handle input voltages of up to 40 volts without damage to the controller. **The COR input must not go below 0V (ground); this would damage controller's COR/PL input**. Using one of the supplied DB-9 Male connectors, connect your COR signal to pin #7.

Connecting a PL Input (optional)

If you wish to use a PL (CTCSS) decoder on any of the receivers, its detect line can be connected to pin #2 of the appropriate connector in the same fashion as the COR input. You will probably also want to use the audio filter on the PL decoder board to filter the PL signal out of the receiver's audio before it goes to the RLC-4.

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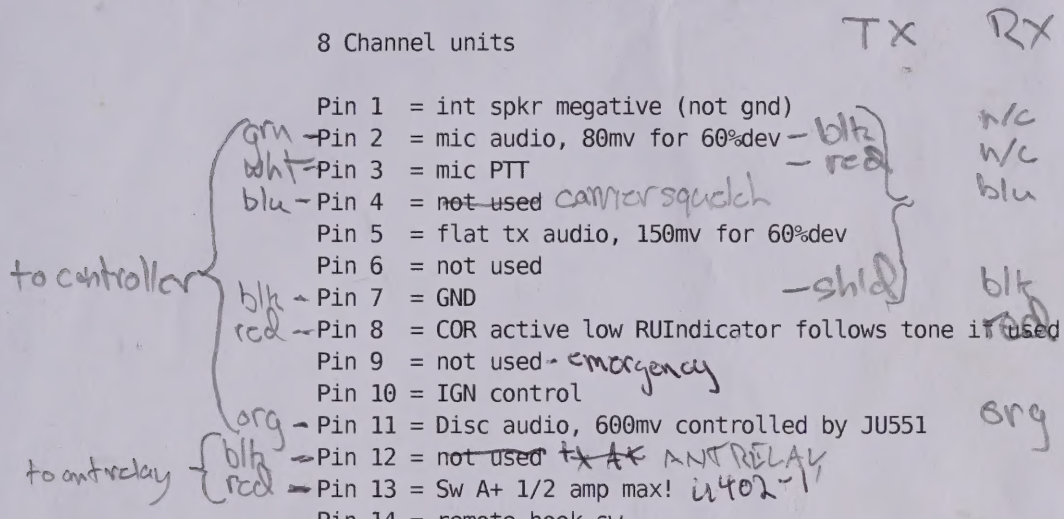
Non-R.I.C.K. Interface Cable

Well here's the scoop on the GM300's, M120's and M10's. The sheet says there is a difference between the 8 and 16 channel units. We'll try to describe both.


TX RX
8 Channel units
Pin 1 = int spkr megative (not gnd)
grn - Pin 2 = mic audio, 80mv for 60%dev
wht - Pin 3 = mic PTT
blu - Pin 4 = not used carrier squelch
Pin 5 = flat tx audio, 150mv for 60%dev
Pin 6 = not used
blk - Pin 7 = GND
red - Pin 8 = COR active low RUIndicator follows tone if used.
Pin 9 = not used - emergency
Pin 10 = IGN control
org - Pin 11 = Disc audio, 600mv controlled by JU551
blk - Pin 12 = not used tx AF ANT RELAY
red - Pin 13 = Sw A+ 1/2 amp max! in402-1
Pin 14 = remote hook sw
Pin 15 = int spkr pos
Pin 16 = ext spkr pos
to controller
to antrelay
blk - red
shld
n/c
n/c
blu
blk
red
org

16 Channel units

same as above except:
Pin 4 = programmable output defaults to external alarm.
Pins 6,8,9,12,14 = programmable I/O (the options can be viewed with the RSS)

I know you can get all the right ins and outs but as you can see, they must be set up.

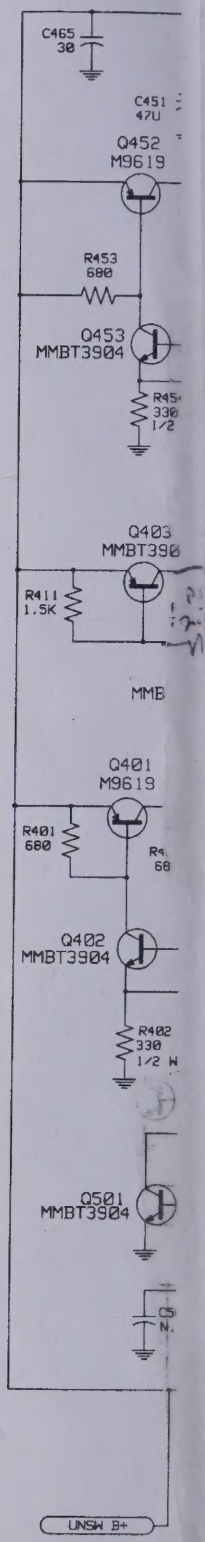
The plug that goes into the radio is as follows.

Looking from the rear of the radio (or plug), Pin 1 is upper right with pin 2 below, pin 16 being lower left. Top row is odd numbers, bottom row is even.

Based on the above information this is how the CROSS-CONNECTION between the radios should go!

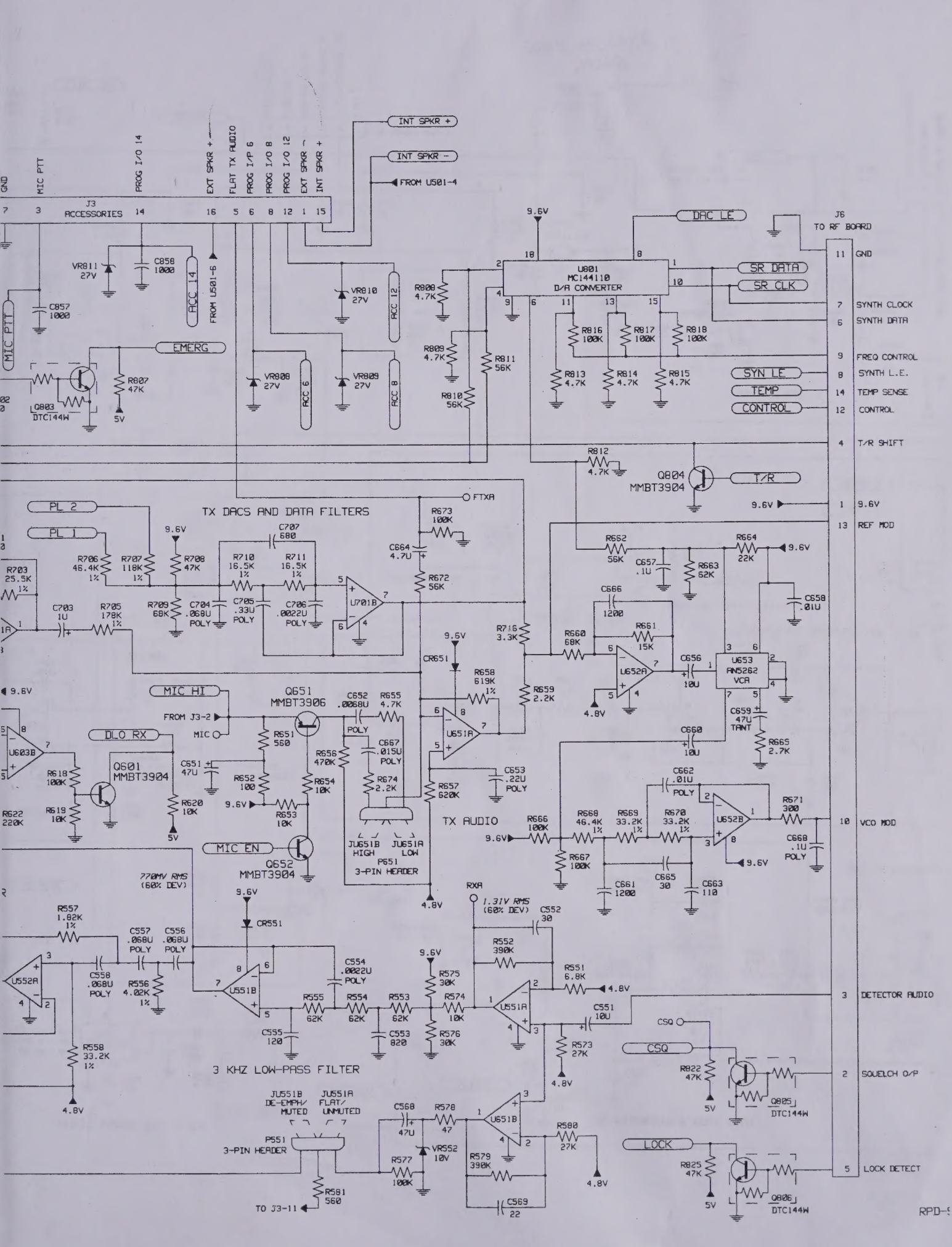
Radio1		Radio2
PIN 3 PTT	_____	PIN 8 COR
PIN 8 COR	_____	PIN 3 PTT
PIN 5 TX Audio	_____	PIN 11 Disc Audio
PIN 11 Disc Audio	_____	PIN 5 TX Audio
PIN 7 Gnd	_____	PIN 7 Gnd

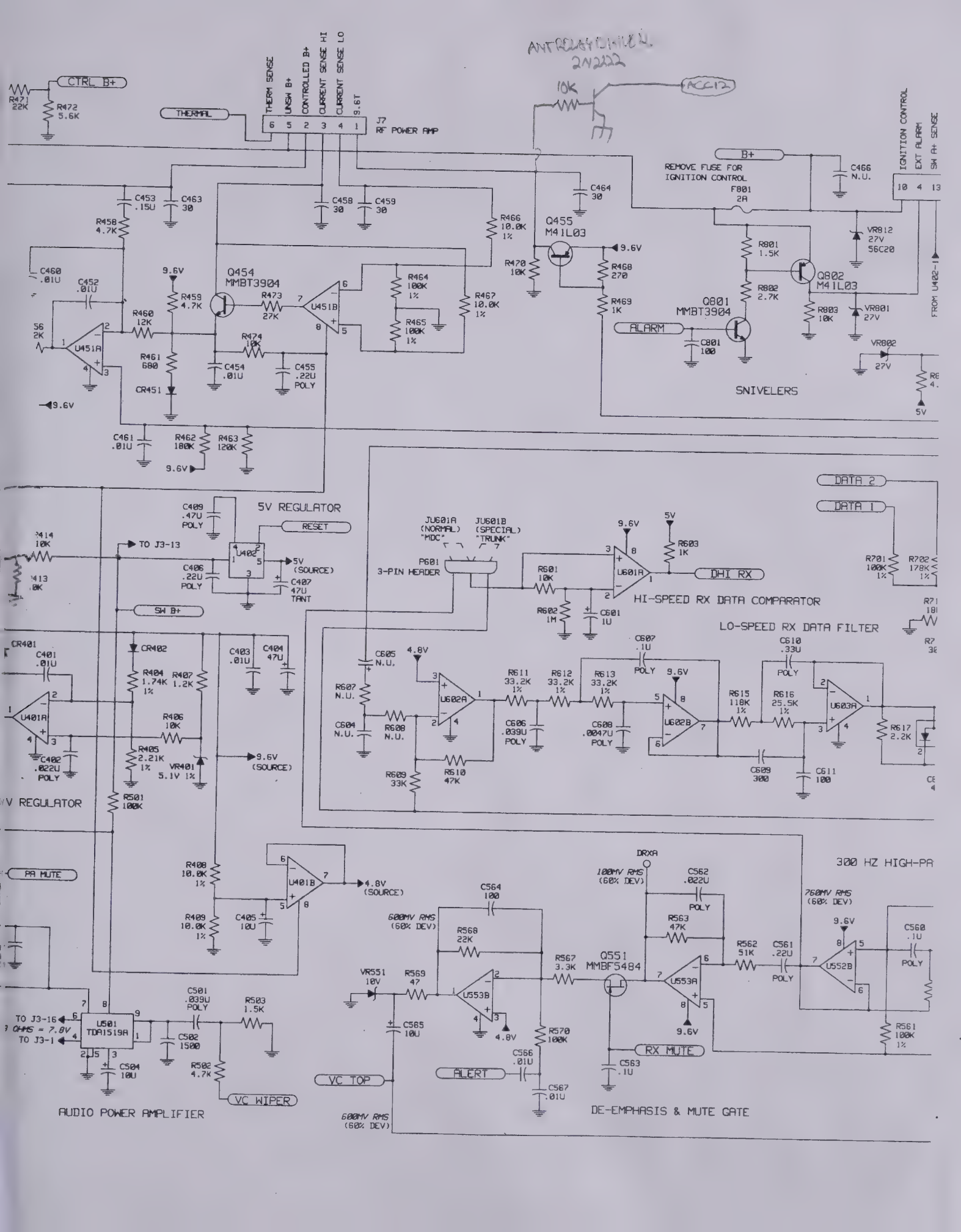
**** CAUTION **** Check to see the programable outputs of the 16 pin

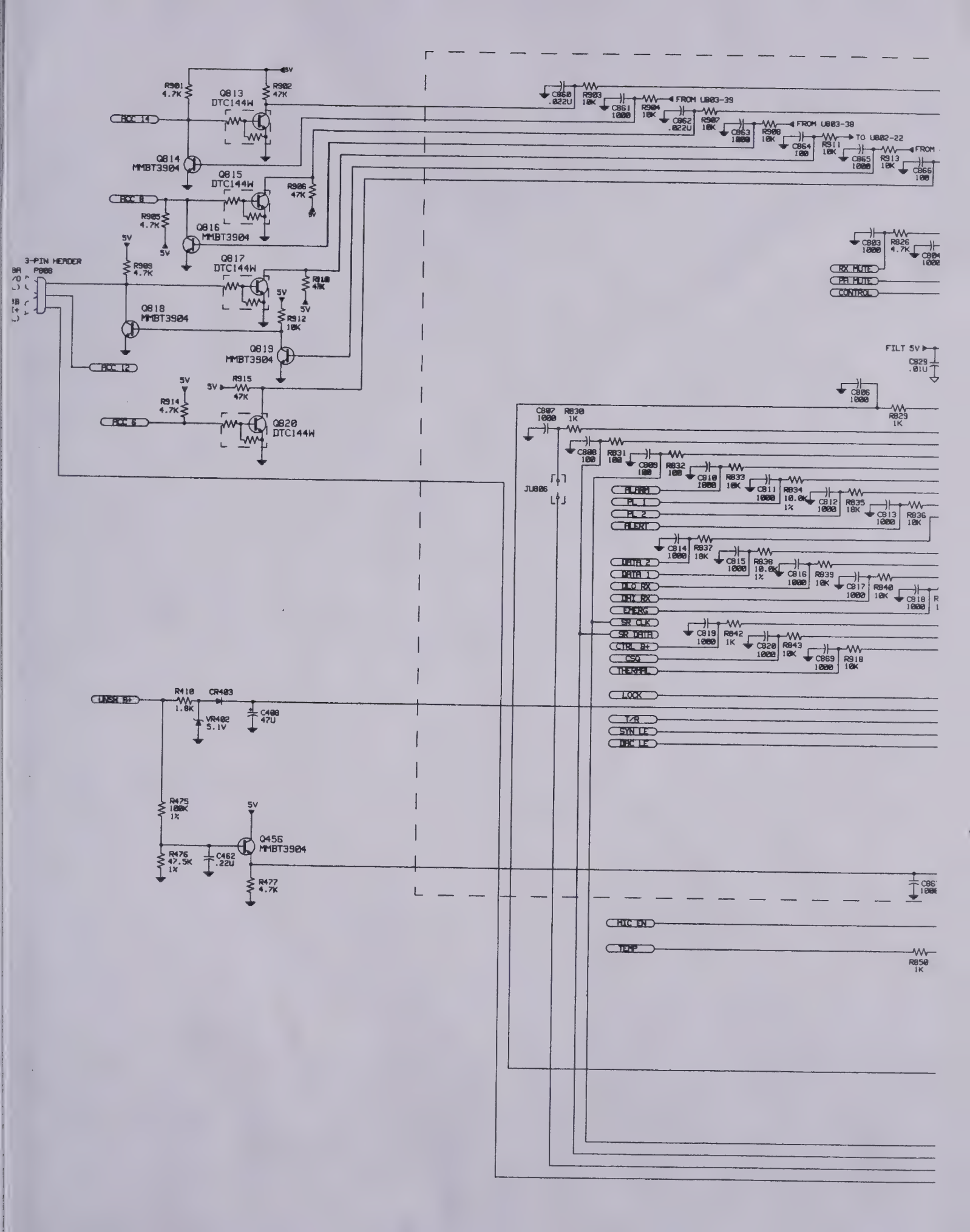


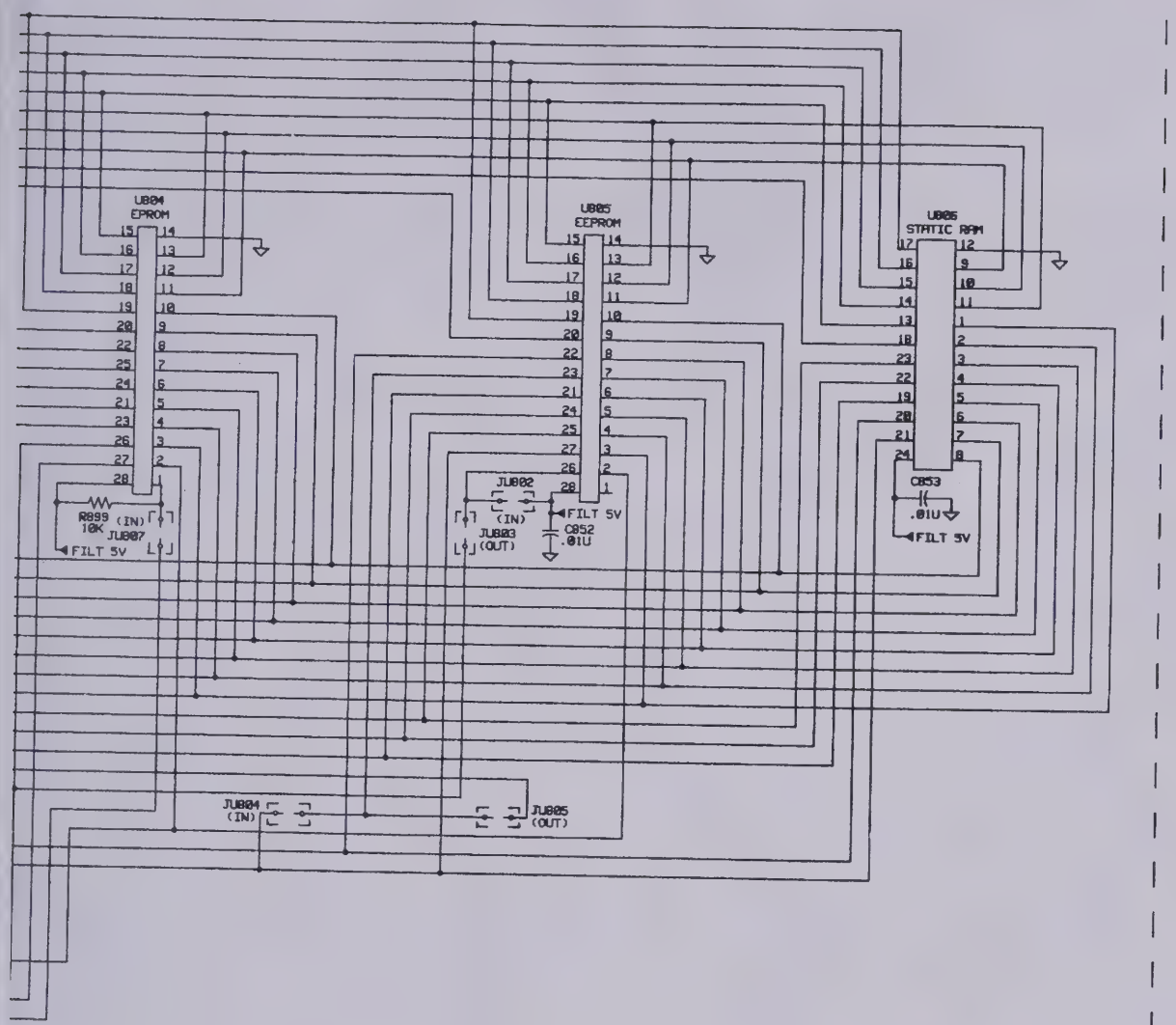
ic Diagram for HLN8070A
ard (4-Layer)

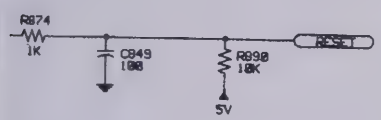
of 2)

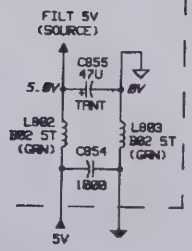

J3
ACCESSORIES
GND
MIC PTT
PROG I/O 14
EXT SPKR +
FLAT TX AUDIO
PROG I/P 6
PROG I/O 8
PROG I/O 12
EXT SPKR -
INT SPKR +
INT SPKR +
INT SPKR -
FROM U501-4
FROM U501-6
ACC 14
ACC 12
ACC 6
ACC 8
VR811 27V
C858 1000
C857 1000
VR810 27V
VR808 27V
VR809 27V
EMERG
R807 47K
Q803 DTC144W
5V
9.6V
DAC LE
U801 MC144110 D/A CONVERTER
SR DATA
SR CLK
R808 4.7K
R809 4.7K
R810 56K
R811 56K
R816 100K
R817 100K
R818 100K
R813 4.7K
R814 4.7K
R815 4.7K
SYN LE
TEMP
CONTROL
J6
TO RF BOARD
11 GND
7 SYNTH CLOCK
6 SYNTH DATA
9 FREQ CONTROL
8 SYNTH L.E.
14 TEMP SENSE
12 CONTROL
4 T/R SHIFT
1 9.6V
13 REF MOD
10 VCO MOD
3 DETECTOR AUDIO
2 SQUELCH O/P
5 LOCK DETECT
R812 4.7K
Q804 MMBT3904
T/R
FTXA
TX DACS AND DATA FILTERS
PL 2
PL 1
R703 25.5K 1%
R706 46.4K 1%
R707 118K 1%
R708 47K
R709 68K
R710 16.5K 1%
R711 16.5K 1%
C703 1U
R705 178K 1%
C704 .068U POLY
C705 .33U POLY
C706 .0022U POLY
C707 680
U701B
R672 56K
R673 100K
C664 4.7U
R716 3.3K
R660 68K
R661 15K
C666 1200
U652A
C656 10U
U653 AN5262 VCA
C659 47U TANT
C658 .01U
R662 56K
C657 .1U
R663 62K
R664 22K
R665 2.7K
C660 10U
CR651
R658 619K 1%
R659 2.2K
U651A
C653 .22U POLY
R657 620K
MIC HI
FROM J3-2
MIC
Q651 MMBT3906
C652 .0068U
R655 4.7K
POLY
C667 .015U POLY
R656 470K
R674 2.2K
R654 10K
R651 560
R652 100
R653 10K
JU651B HIGH
JU651A LOW
P651 3-PIN HEADER
DLO RX
Q601 MMBT3904
R620 10K
C551 47U
R618 100K
R619 10K
R622 220K
U603B
MIC EN
Q652 MMBT3904
TX AUDIO
R666 100K
R668 46.4K 1%
R669 33.2K 1%
R670 33.2K 1%
U652B
R671 300
C668 .1U POLY
R667 100K
C661 1200
C665 30
C663 110
C662 .01U POLY
770MV RMS (60% DEV)
1.31V RMS (60% DEV)
RXA
CR551
R557 1.82K 1%
C557 .068U POLY
C556 .068U POLY
C558 .068U POLY
R556 4.02K 1%
U552A
U551B
C554 .0022U POLY
R555 62K
R554 62K
R553 62K
C555 120
C553 820
R575 30K
R574 10K
R576 30K
C552 30
R552 390K
R551 6.8K
U551A
C551 10U
R573 27K
R558 33.2K 1%
3 KHZ LOW-PASS FILTER
JU551B DE-EMPH/ MUTED
JU551A FLAT/ UNMUTED
P551 3-PIN HEADER
C568 47U
R578 47
U651B
R580 27K
R579 390K
C569 22
VR552 10V
R577 100K
R581 560
TO J3-11
CSQ
R822 47K
Q805 DTC144W
LOCK
R825 47K
Q806 DTC144W
RPD-9

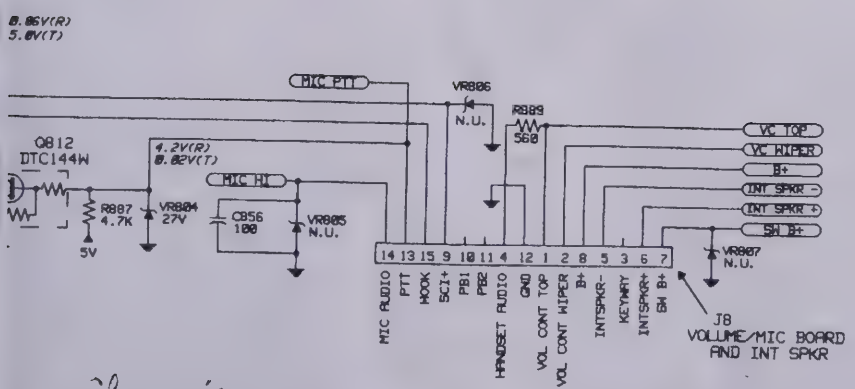

ANT RELAY DRIVER
2N2222
10K
ACC12
CTRL B+
R471 22K
R472 5.6K
THERMAL
THERM SENSE
UNSW B+
CONTROLLED B+
CURRENT SENSE HI
CURRENT SENSE LO
9.6T
J7
RF POWER AMP
B+
REMOVE FUSE FOR IGNITION CONTROL
F801 2A
C466 N.U.
IGNITION CONTROL
EXT ALARM
SW A+ SENSE
10 4 13
C453 .15U
C463 30
C458 30
C459 30
C464 30
R458 4.7K
R466 10.0K 1%
Q455 M41L03
9.6V
R468 270
R469 1K
R470 10K
R801 1.5K
R802 2.7K
R803 10K
VR812 27V 56C20
VR801 27V
VR802 27V
Q802 M41L03
Q801 MMBT3904
ALARM
C801 100
FROM U402-1
SNIVELERS
C460 .01U
C452 .01U
Q454 MMBT3904
R459 4.7K
R473 27K
R464 100K 1%
R465 100K 1%
R467 10.0K 1%
R460 12K
R474 10K
R461 680
CR451
C454 .01U
C455 .22U POLY
U451A
U451B
56 2K
C461 .01U
R462 180K
R463 120K
5V REGULATOR
C409 .47U POLY
RESET
U402
TO J3-13
5V (SOURCE)
C406 .22U POLY
C407 47U TANT
SW B+
DATA 2
DATA 1
R701 100K 1%
R702 178K 1%
JU601A (NORMAL) "MDC"
JU601B (SPECIAL) "TRUNK"
P601 3-PIN HEADER
R601 10K
R602 1M
C601 1U
U601A
R603 1K
DHI RX
HI-SPEED RX DATA COMPARATOR
LO-SPEED RX DATA FILTER
CR401
CR402
C401 .01U
R404 1.74K 1%
R407 1.2K
C403 .01U
C404 47U
U401A
R406 10K
R405 2.21K 1%
VR401 5.1V 1%
C402 .022U POLY
9.6V (SOURCE)
R501 100K
V REGULATOR
C605 N.U.
R607 N.U.
C604 N.U.
R608 N.U.
R609 33K
R610 47K
U602A
R611 33.2K 1%
R612 33.2K 1%
R613 33.2K 1%
C606 .039U POLY
C608 .0047U POLY
C607 .1U POLY
U602B
C610 .33U POLY
R615 118K 1%
R616 25.5K 1%
U603A
R617 2.2K
C609 300
C611 100
PA MUTE
R408 10.0K 1%
R409 10.0K 1%
C405 10U
U401B
4.8V (SOURCE)
300 HZ HIGH-PA
DRXA
100MV RMS (60% DEV)
C562 .022U POLY
760MV RMS (60% DEV)
600MV RMS (60% DEV)
C564 100
R568 22K
R563 47K
R567 3.3K
Q551 MMBF5484
VR551 10V
R569 47
U553B
U553A
R562 51K
C561 .22U POLY
U552B
C560 .1U POLY
R561 100K 1%
C565 10U
R570 100K
C566 .01U
C567 .01U
C563 .1U
RX MUTE
ALERT
VC TOP
600MV RMS (60% DEV)
DE-EMPHASIS & MUTE GATE
TO J3-16
TO J3-1
U501 TDA1519A
C501 .039U POLY
R503 1.5K
C502 1500
R502 4.7K
C504 10U
VC WIPER
AUDIO POWER AMPLIFIER


3-PIN HEADER
P808
Q813 DTC144W
Q814 MMBT3904
Q815 DTC144W
Q816 MMBT3904
Q817 DTC144W
Q818 MMBT3904
Q819 MMBT3904
Q820 DTC144W
Q456 MMBT3904
VCC 14
VCC 8
VCC 12
VCC 6
5V
FROM U803-39
FROM U803-38
TO U802-22
RX MUTE
PA MUTE
CONTROL
FILT 5V
JU806
ALARM
PL 1
PL 2
ALERT
DATA 2
DATA 1
DLO RX
DAT RX
EMERG
SR CLK
SR DATA
CTRL B+
CSQ
THERMAL
LOCK
T/R
SYN LE
DEC LE
MIC EN
TEMP
UNSW B+
VR402 5.1V
CR403



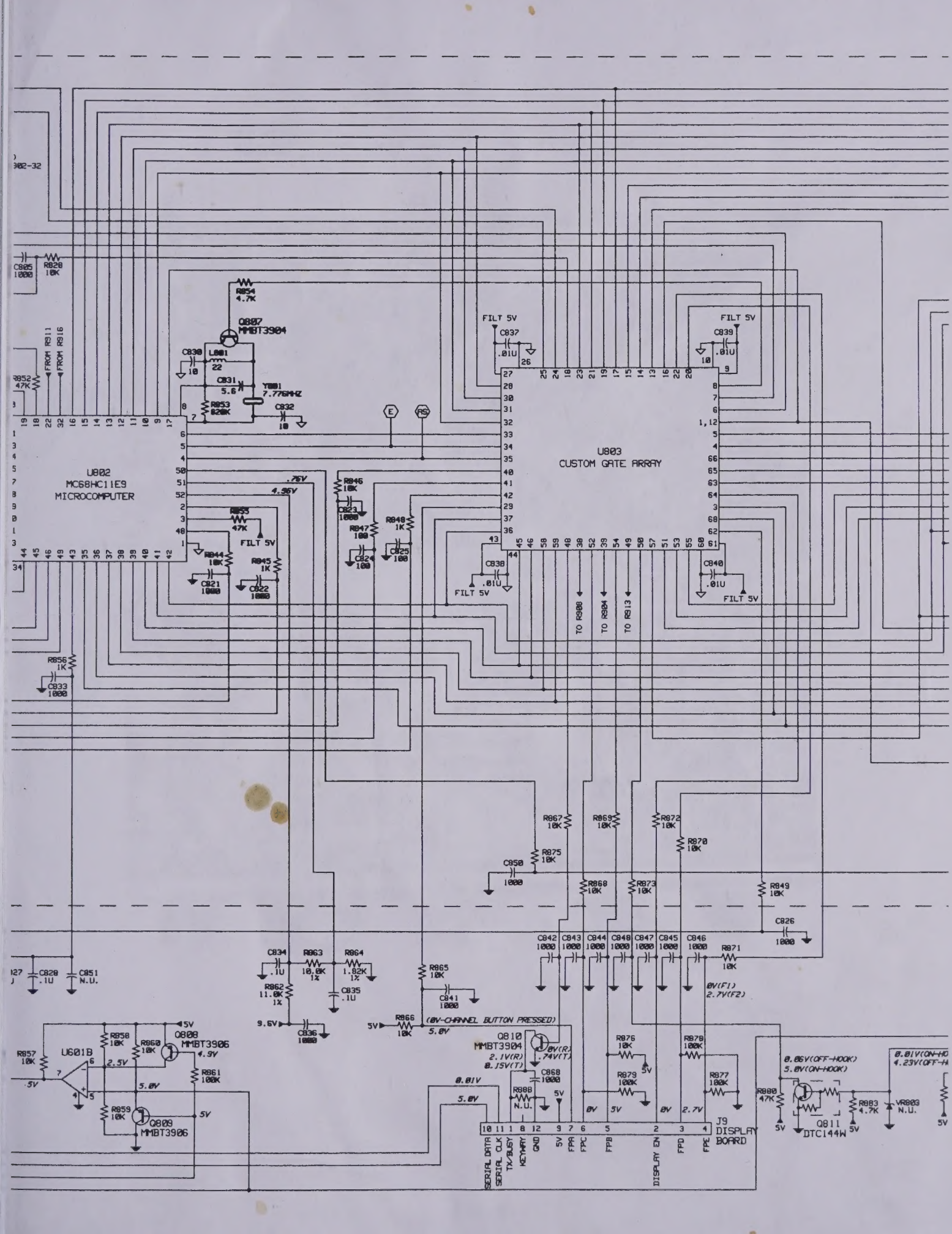






RPD-92111-0

Schematic Diagram for HX290A


U802
MC68HC11E9
MICROCOMPUTER
U803
CUSTOM GATE ARRAY
Q807
MMBT3904
Y801
7.776MHZ
FILT 5V
TO R908
TO R904
TO R913
(8V-CHANNEL BUTTON PRESSED)
U601B
Q808
MMBT3906
Q809
MMBT3906
Q810
MMBT3904
Q811
DTC144W
J9
DISPLAY
BOARD
SERIAL DATA
SERIAL CLK
TX-BUSY
KEYMAY
GND
5V
FPA
FPC
FPB
DISPLAY EN
FPD
FPE

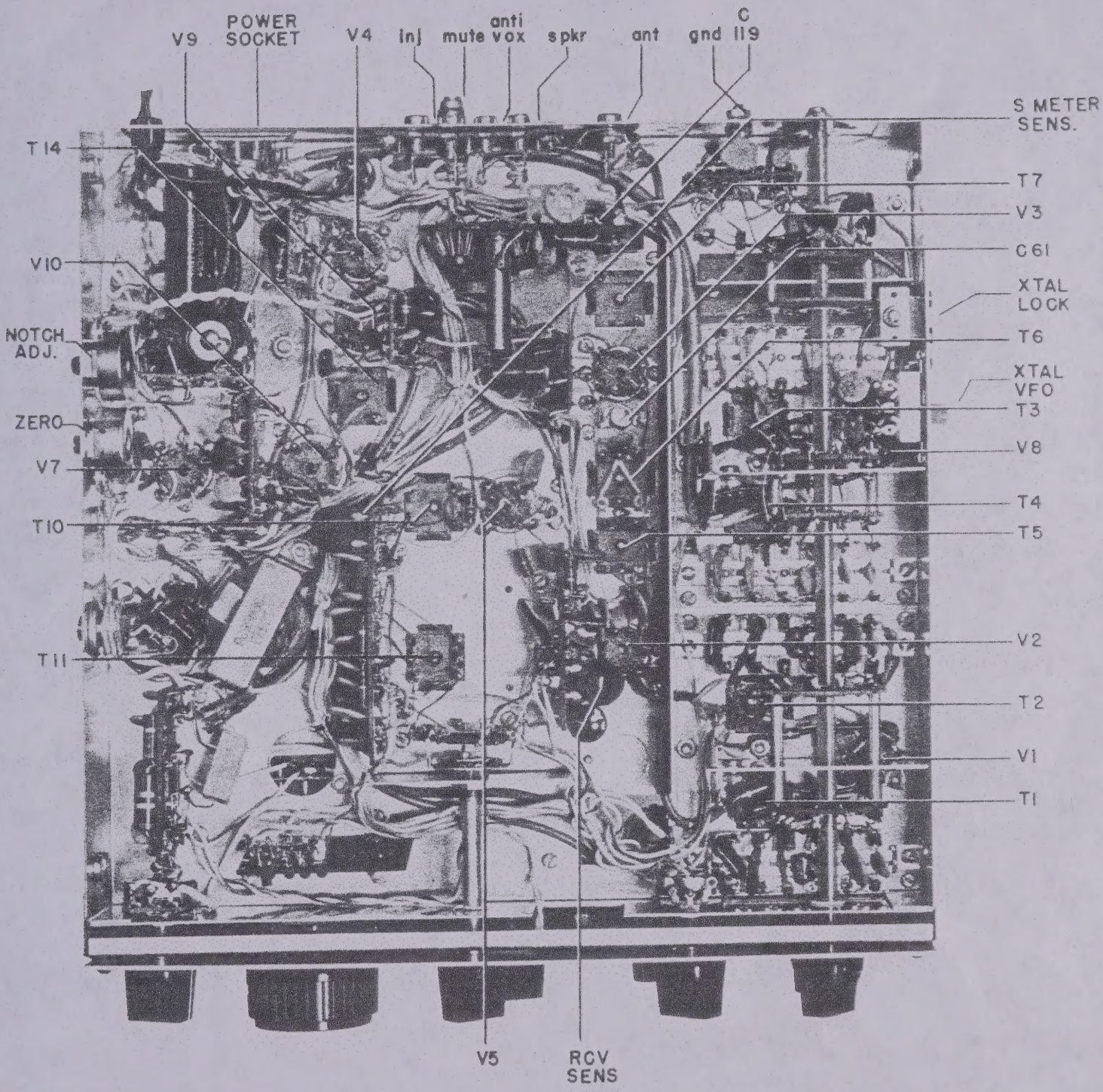


FIGURE #13 BOTTOM VIEW